Amendments to the Claims

1. (currently amended) Switching element for modifying the electric resistance comprising:

a. at least one high temperature superconductor ~~(1)~~;

b. means ~~(3)~~ for irradiating electromagnetic high frequency onto the at least one high temperature superconductor ~~(1)~~.

2. (currently amended) Switching element according to claim 1, wherein the high temperature superconductor ~~(1)~~ is provided as a thin layer of a high temperature superconductor.

B2

3. (previously amended) Switching element according to claim 1, wherein the high frequency is in the MHz-range and in particular less than 200 MHz.

4. (currently amended) Switching element according to claim 1, wherein the means ~~(3)~~ for irradiating the electromagnetic high frequency comprise at least one coil ~~(6)~~ arranged close to the at least one high temperature superconductor ~~(1)~~.

5. (currently amended) Switching element according to claim 4, wherein the coil ~~(6)~~ is provided as a flat coil arranged on the high temperature superconductor ~~(1)~~.

6. (currently amended) Switching element according to claim 4, wherein the coil ~~(6)~~ is manufactured from a superconducting material.

7. (currently amended) Switching element according to claim 1, wherein the means ~~(3)~~ irradiate the electromagnetic high frequency in the form of at least one pulse.

8. (original) Switching element according to claim 7, wherein the time length of the pulse is between 1 μs and 1 s.

9. (original) Switching element according to claim 7, wherein the time length of the pulse is in the range of a few milliseconds.

10. (currently amended) Current limiter for limiting the maximally allowed current in an electric circuit comprising:

a. a switching element ~~(1, 6)~~ according to one of the claims 1 to 9;

b. means for triggering the irradiation of electromagnetic high frequency in response to the detection that the maximally allowed current is exceeded.

B2 cont

11. (currently amended) Current limiter according to claim 10, wherein the switching element ~~(1, 6)~~ remains in a resistive state after triggering the irradiation.

12. (currently amended) Current limiter according to claim 10, further comprising means for cooling which bring the high temperature superconductor ~~(1)~~ of the switching element back into a superconducting state after turning off the electromagnetic irradiation.

13. (currently amended) Magnetic energy storage comprising:

a. a magnetic coil ~~(20)~~ for storing energy;

b. a switching element ~~(1, 6)~~ according to one of the claims 1 to 9, wherein

c. the switching of a switching element ~~(1, 6)~~ leads to a decoupling of the stored energy.

14. (original) Magnetic energy storage according to claim 13, wherein the switching element is arranged as points for a current directing in the normal conducting state the current to an external consumer.

15. (currently amended) Flow pump for loading an inductivity ~~(30)~~ with current, comprising:

a. means ~~(40)~~ for providing an alternating voltage;

b. a first ~~(1, 6)~~ and a second ~~(1', 6')~~ switching element according to one of the claims 1 to 9, wherein

c. the first ~~(1, 6)~~ and the second ~~(1', 6')~~ switching element are arranged parallel to the inductivity ~~(30)~~ and are alternatingly operable to stepwise increase the current in the inductivity ~~(30)~~.

16. (currently amended) Flow pump according to claim 15, wherein the means ~~(40)~~ for providing an alternating voltage comprise a transformer ~~(40)~~ and wherein the primary coil of the transformer is thermally isolated from the secondary coil of the transformer ~~(40)~~.

17. (previously amended) Flow pump according to claim 15, wherein the alternating voltage has a frequency of 20 Hz and the closing time of the switching element is approximately 15 ms.

18. (currently amended) Rectifier for rectifying the alternating current of an alternating current source ~~(40)~~ comprising:

a. at least one first switching element ~~(1, 6)~~ according to one of the claims 1 to 9;

b. at least a second switching element ~~(1', 6')~~ according to any of the claims 1 to 9, wherein

c. the first ~~(1, 6)~~ and the second ~~(1', 6')~~ switching element are arranged parallel to a direct current output and can be triggered in antiphase.

19. (currently amended) Rectifier according to claim 18, wherein the alternating current source ~~(40)~~ comprises a transformer ~~(40)~~ and wherein the primary coil of the transformer ~~(40)~~ is thermally isolated from the secondary coil of the transformer ~~(40)~~.

20. (currently amended) Inverted rectifier for inverse rectifying a direct voltage of a direct current source ~~(30)~~, comprising:

a. at least one first switching element ~~(1, 6)~~ according to one of the claims 1 to 9;

b. at least a second switching element ~~(1', 6')~~ according to one of the claims 1 to 9, wherein

c. the first ~~(1, 6)~~ and the second switching element ~~(1', 6')~~ are arranged parallel to the direct current source ~~(30)~~ and can be triggered in antiphase.

21. (currently amended) Inverted rectifier according to claim 20, wherein further a transformer ~~(40)~~ is arranged for decoupling the alternating voltage and wherein the primary coil of the transformer ~~(40)~~ is thermally isolated from the secondary coil of the transformer ~~(40)~~.

B2 cont

22. (currently amended) Method for switching at high temperature superconductor ~~(1)~~ comprising the following steps:

a. providing a high temperature superconductor ~~(1)~~ in its superconducting state;

b. irradiating an electromagnetic high frequency until the high temperature superconductor ~~(1)~~ switches into the normal conducting state.

23. (currently amended) Method according to claim 22, wherein the high temperature superconductor ~~(1)~~ is a thin layer of a high temperature superconductor.

24. (previously amended) Method according to claim 22, wherein the electromagnetic high frequency is in the MHz range, preferably less than 200 MHz.

25. (previously amended) Method according to claim 22, wherein the high frequency is irradiated as one or more pulses.

26. (original) Method according to claim 25, wherein the time length of the pulses is in the range of 1 μs to 1 s.